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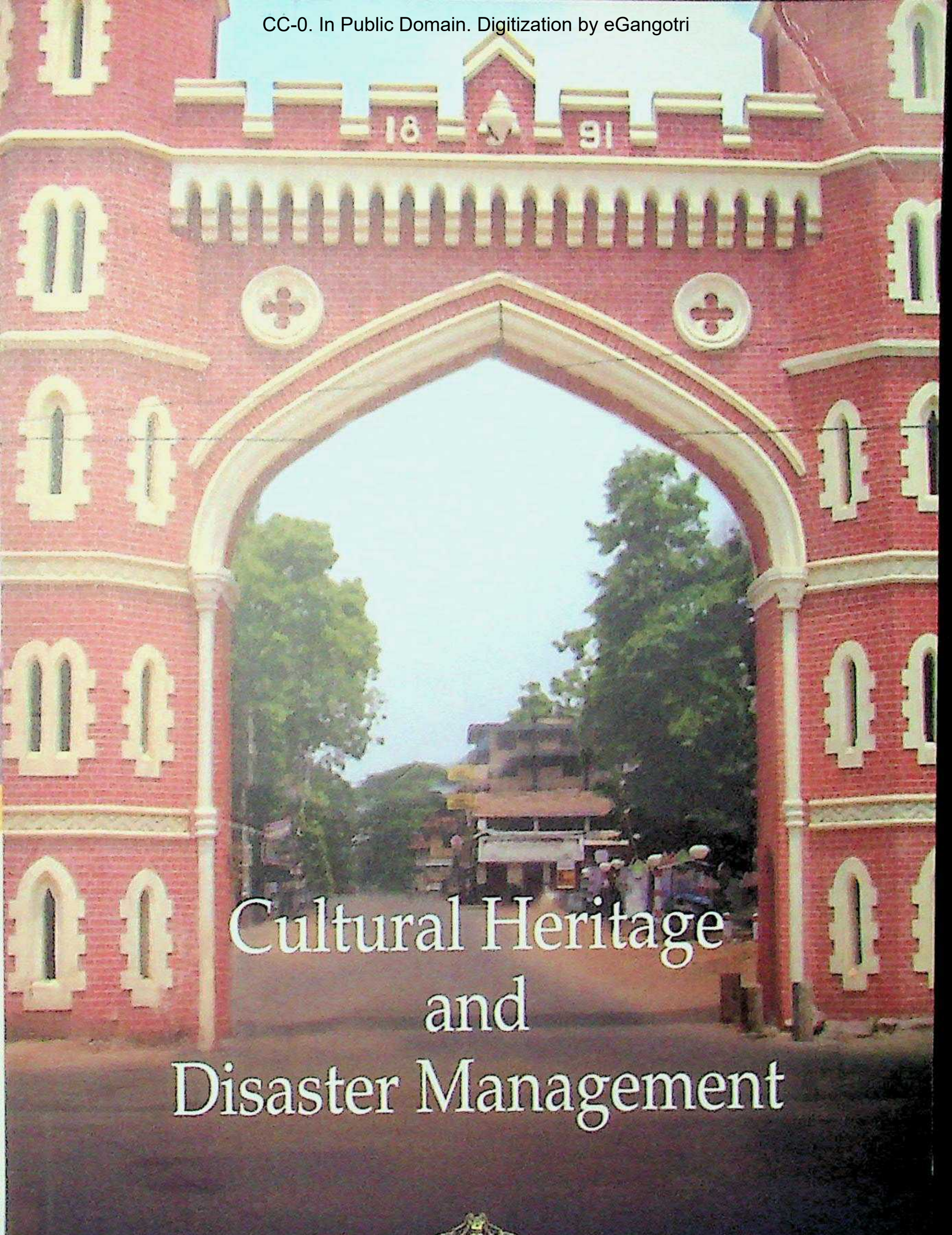

Cultural Heritage and Disaster Management

State Archives Department
Government of Kerala

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CULTURAL HERITAGE
AND
DISASTER MANAGEMENT

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CULTURAL HERITAGE
AND
DISASTER MANAGEMENT

Editor

S.Raimon

Kerala State Archives Department
Government of Kerala
2006

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Editor
S. Raimon

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Preface

The world has seen disasters both natural and man-made and which have caused severe destruction to life and property. In the world of impending disasters, it has become the need of the day to be prepared and respond to small and large-scale events, which pose threat to our life and cultural wealth. It is indispensable that everyone is equipped with certain basic tactics for a life saving and property protection mission in the wake of a disaster. The archival repositories, archaeological museums, libraries, heritage monuments and other literary and cultural treasures are to be protected from all possible disasters, through proper and timely preparations and through the implementation of an effective disaster management programme.

The research papers included in this volume are a compilation of the papers read at the National Seminar on Disaster Management relating to cultural properties held under the joint auspices of the Kerala State Archives Department and the National Museum Institute, New Delhi. I hope that the information disseminated through these research papers will help all those engaged in the management of our rich cultural heritage, to evolve tactics to mitigate and manage unexpected disasters.

I take this opportunity to place on record my sincere gratitude to Sri. A.P.Anil Kumar, Hon. Minister for Cultural

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Affairs for the initiative taken by him in the publication of this volume. I express my gratitude to Sri. E.K.Bharat Bhushan IAS, Principal Secretary (Cultural Affairs), Sri. G. Mohanakumaran Nair, Additional Secretary (Culture) and members of the State Archives Advisory Council, for their support, encouragement and advice in the publication of the volume. I must also express my thanks to Dr. M.V. Nair, Director, NRLC, Lucknow who took the initiative in organizing the National Seminar in Trivandrum. I also thank the contributors of research papers and the staff of the Archives Department.

I express my sincere thanks to Sri.Tomin J. Thachankari, Managing Director and the staff of KBPS for the neat and prompt printing of this volume.

Trivandrum
10-3-2006

S.Raimon
Director (Archives)

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Contents

Preface

1. Developing a Disaster Mitigation Strategy for Museums - *Dr. S.N. Pandey* 1

2. Disaster Management Plan in Government Museum, Chennai - *Dr.R.Kannan* 9

3. Disaster Planning and Management *Satish C. Pandey* 26

4. Workshop on Museums and Disasters: Planning Preparedness and Management - *K.Rajaram* 28

5. Museum Disaster Planning, Preparedness and Management - *S. Sethuramalingam* 33

6. Disaster Management Guidelines for Heritage Monuments - *Jenee P.* 54

7. Role of Planning in Disaster Management of the Museums *Dr. S.Darsana* 59

8. Disaster- Preventive Methods in Archives *Easwaran P.* 65

9. Education and Training of Museum Personnel and the Public in Disaster Management *Dr. V. Selvakumar* 69

10. Disaster Management and Preparedness for Conservation Laboratories - *Dr. V.R. Shaji* 75

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DEVELOPING A DISASTER MITIGATION STRATEGY FOR MUSEUMS

Dr. S.N. Pandey

Disasters, natural or man-made seem to have become a part and parcel of everyday life. This increase in emergency situations has caused enormous loss of life and property and has affected every walk of life from the common man to business and industry to Governments. Museums should be no exception to these effects, more so as they house irreplaceable treasures and artifacts, which represent the icons of human history and civilization. This paper highlights the major steps that go into planning and implementing a disaster mitigation strategy in a museum.

What is a disaster?

To better appreciate a strategy that involves disaster mitigation, it would be appropriate to understand what a disaster is and what mitigation is all about.

A disaster is any unplanned event that can cause deaths or significant injuries to employees or the public; or that which can disrupt operations, cause physical or environmental damage, or threaten the facility's financial standing or public image. Thus disasters may include anything ranging from fires, floods, cyclones, earthquakes, terrorist acts, communication failures or civil disturbances.

Dr. S.N. Pandey, Assistant Director, Department of Museums, Government of Gujarat, Museum and Picture. Gallery, Sayajibaug, Vadodara-390018

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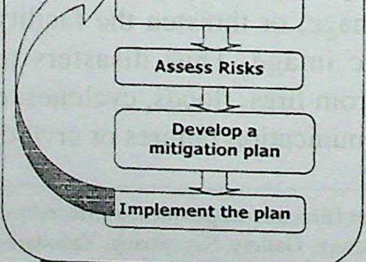
Mitigation is defined by dictionaries as "to make less severe or less harmful". So by having a disaster mitigation strategy in place, a museum may not be able to altogether prevent disasters or neutralize their effects but can certainly reduce the effects of such disasters.

The Disaster Mitigation Strategy

The approach for implementation of a disaster mitigation strategy is presented below. A feedback-based approach that is shown below ensures that strategy is constantly updated based on new threats of disasters and evolving technological innovations. The process consists of four basic phases as shown. The first phase, Organize Resources, addresses the creation of a planning team with representatives from within the museum staff, police and law enforcement agencies, public and non-governmental organizations. The second phase, Assess Risks, explains identifying hazards and assessing losses. The third and fourth phases, Develop a Mitigation Plan and Implement the Plan and Monitor Progress, discuss establishing goals and priorities and selecting mitigation projects, and writing, implementing, and revisiting the mitigation plan, respectively.



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Organize Resources

This process involves identifying a team of people who would be responsible for the implementation of the plan. The team composition should involve key stakeholders who are involved in museum activities and should be provided with appropriate authority. The team should also involve major outside agencies as fire prevention agencies, police, hospitals and community service organizations so that the onus of disaster management of a key institution as a museum lies on the society at large.

This process also involves setting up a budget and a time schedule for the disaster mitigation plan to be in place so that authorities and responsibilities are clear to the team. Also, the availability of funds would enable deciding the strategy for disaster mitigation. Eg; smaller amount of funds would not allow the setting up of separate facilities as a disaster recovery site but could be utilized for smaller jobs as reducing damage by earthquakes, etc.

Assess Risks

This phase would involve assessment of the current position of the museum as far as disaster preparedness is concerned. This would involve the identification of current resources and capabilities for disaster mitigation. This would include identification of fire prevention and fire escape systems, flood prevention systems, assessment of security systems/ personnel to mitigate risks as thefts and terrorist attacks, evaluation of employee training on disaster management and evaluation of backup systems received from the external agencies like police, fire brigade and hospitals.

Once the current position is identified, a thorough vulnerability analysis needs to be carried out to identify the

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risks that would impact a museum the most. This is done by first listing out the potential disasters that would impact a given museum. The factors that can provide an indication of these potential disasters are:

Historical factors

Has the museum in the past been impacted by floods, fires, terrorism, earthquakes, etc?

Geographic factors:

Is the museum located in a region that is a earthquake zone, near flood plains or dams, has hazardous industrial facilities like nuclear plants nearby, or is in an area where terrorists are active?

Human Factors

Are the employees properly trained to act in emergency situations?

Physical factors

Is the museum constructed and its " interiors" designed in such a way to withstand earthquakes, floods and attacks by terrorists?

Once the key risks that can impact a museum are identified the impacts that they can cause need to be identified. The impacts can be on human life, property and assets of the museum and those on the reputation of the museum. Once identified, the impact on each of the factors has to be rated on a scale of 1-5; eg; the impact of a terrorist attack on human life can be 5 but that of a theft in the museum may be less ie., say 2.

Further the probability of occurrence of each of the events listed has to be identified. The events that have the maximum

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impact and the highest probability of occurrence should be high on the agenda of the plan to be developed.

Develop a Mitigation Plan

This is the key element in the disaster mitigation strategy building process. The plan for disaster mitigation involves the major strategies and the key tactics for handling specific disasters.

The plan should clearly describe the responsibility structure and the command structure for emergency situations. This would involve command and control for the disaster mitigation function as a whole as well as for a particular incident. For example the disaster mitigation function can be headed by the Director of the museum. However, the responsibility of an incident like a theft should lie with the chief security officer.

The plan should include tactics for life saving as well as property protection. Key areas for evacuation life saving tactics include evacuation, planning and assembly area for the evacuees, development of fire safety exits, development of emergency shelters in case of terrorist attacks, bombing etc, provision of suitable banners and posters throughout the museum to educate the visitors on safety procedures and training the employees on disaster preparedness and life saving procedures.

Property protection is one of the key areas for disaster management in museums. This is because the museum houses irreplaceable antiquities and objects of art. The key tactics for property protection in museums are:

Protection Systems

- Fire Protection systems like automatic sprinklers, smoke detectors, fire extinguishers, etc.

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- Lightning protection systems
- Water level indicators to forewarn of floods
- Emergency power generation systems
- Security systems as alarms and laser detectors to prevent theft
- Bullet proof showcases for valuable artifacts to minimize damage during terrorist attacks

Mitigation Tactics

Certain basic mitigation tactics in museums can prevent large disasters from occurring. These are mainly

- Installation of fireproof roofing and furniture to prevent major outbreaks of fire
- Water proofing of walls and roofs to prevent damage from floods and heavy rainfall
- Maintenance of logistics and trucks to relocate valuable articles to new locations in case of floods and other natural calamities
- Maintenance of some collections in another location/ store to prevent destruction of the entire collection in a single disaster
- Fastening of show-cases and cabinets to walls/ flooring/ ceilings to prevent damage by mild tremors and cyclones
- Fastening of display objects by Velcro, detachable adhesives to show-cases to prevent breakage due to tremors, wind or other shocks
- Installation of electrical systems above the 100 year flood level so as to prevent damage during floods

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- Use large eye hooks or anchoring screws larger than 12 inches to hang painitings and other objects. These screws would penetrate the wall and not just the dry plaster and thus prevent dislodging of frames during mild earthquakes
- Maintaining microfilm copies of manuscripts and records in a separate location

Apart from life and property protection systems a disaster mitigation plan should include plans for restoration of damaged antiquities and insurance policies covering losses of life and property. It should also include plans for restarting the museum operations as soon as possible by salvaging the remaining objects of art, physically securing the salvaged property to prevent theft/ other damage, help investigating agencies/ insurance companies assess the damage and make appropriate claims for the same, notify employees of the damage caused and keep the media informed to prevent any damage to the reputation of the museum.

Implementation of the plan

The implementation of a disaster mitigation plan involves the incorporation of the plan into the very work culture of the museum. This can be achieved by communication of the plan to all employees, various posters and banners in the museum highlighting the need for safety procedures and thereby educating the visitors towards disaster mitigation, training of employees towards disaster mitigation procedures, etc.

The employee training should involve major stakeholders as the fire prevention services, police and hospitals. The employee training can be conducted through table-top exercises, walk through drills and simulations of real time emergency situations.

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The implementation of the plan is a process of continuous improvements in the plan. New technological advances need to be incorporated in the plan and the list of disasters and their probabilities regularly updated to keep the museum on its toes when the real disaster happens.

Conclusion

Museums are the storehouses of knowledge and heritage and the most effective media to peep into mankind's yesterday. Today's dangerous times prompt us to develop solutions that would preserve these storehouses to be explored by the generations of tomorrow. Suitable planning and implementation of disaster management strategies discussed above would equip us with better means to preserve and pass on this heritage to the future generations.

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DISASTER MANAGEMENT PLAN IN GOVERNMENT MUSEUM, CHENNAI

Dr.R.Kannan

Abstract

Disaster management in museums is getting importance as awareness of the possibility of museums adopting hi-tech gadgets in display, security etc grows. Government Museum, Chennai has brought out a Manual for the Disaster Management in Museums for the exclusive use of the museum personnel. This is a first for museums in India. The nature of the various kinds of disasters, their management by way of preparedness to meet any kind of disaster, activities to be performed during the disaster, duties of each member of the disaster response team, disaster management plan etc are part of Disaster Preparedness. Fire, flood, earthquake, bombing, war, theft end burglary. infestation of pests etc., are some of the disasters one should be aware of. Training in preparedness, security arrangements, monitoring the activities of various cadres of staff, review of the security, preventive measures with the officials of the department and concerned officials of the connected departments are carried out regularly to avoid fire, theft etc., in the museum. Both, manual and electronic gadgets and manpower are used to tackle and prevent the disasters. This paper deals with various disasters, causes, prevention, disaster management plan,

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disaster response team and the duties of the team members, various gadgets used for security etc.

Introduction

Disaster means a great or sudden misfortune or terrible accident. This in the case of museum can be flood, heavy leakage in the roof of a building, infestation with biological agents, fire, an earthquake, other man-made problems such as religious war, bombing, theft etc. Disaster can be natural or man-made. Whatever may be the type of disaster, when it occurs, it is very difficult to safeguard the antiquities and human beings in the museum. Therefore a disaster management plan is required for a museum to handle the disaster before, while and after its occurrence. This paper deals with the Disaster Management Plan, the preventive measures and the recovery measures taken in the Government Museum, Chennai.

A Disaster Management Plan

Disaster Management is very important for any museum. It makes the staff aware of the various possible disasters in a museum, its prevention procedures, training in disaster management, after disaster procedures in case of museum objects. When I joined as Joint Relief Commissioner of Relief Measures, Government of Tamil Nadu in 1985-86, the discipline of Disaster Management was in a nascent state. I had occasion to participate in a World Health Organisation Seminar and a Workshop in Administrative Staff College of India, Hyderabad held in 1985-1986. At that time Disaster Management consisted of Flood and Drought Management. Chemical and industrial disasters were new. The Bhopal tragedy had just then struck, but preparedness was a new experience. I had prepared a Flood and Drought Management

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Manual. It reflected the state of technology then. Personal Computers were just beginning to be known. Most District Collectors had telephones, which operated on the Central Battery System -the receiver had to be lifted and the operator would connect the desired number. Today, technology has had a quantum jump with Cellular Phones giving access at all locations and powerful portable computers, which can be linked by mobile phones. This would have been the stuff of science fiction then. However, my previous experience has sensitised me to the need for Anti-Disaster Management Planning and Management. The recent fire in the General Post Office, a heritage building was an eye-opener. A fire fighting drill was organised for the staff of the Government Museum, Chennai and staff associated with the museum during December, 2000 in batches with the help of the Fire Service Department staff and the supplier of the fire fighting equipment. It so happened that on 21st of December 2000, during a school function in the Museum Theatre, the front curtain caught fire. The staff of the museum with the help of the fire extinguishers just then installed in the theatre and the training they had just received swiftly plunged into action within seconds and extinguished the fire and saved a priceless heritage building of Chennai. Action has been subsequently taken to strengthen the fire fighting equipment in the district museums also.

Disaster Preparedness Plan

Having a Disaster Preparedness Plan means a museum has implemented action to prevent disasters from occurring and has prepared by developing the necessary procedures to effectively respond to and recover from a disaster when it does occur,thereby reducing the impact on the staff, the collection and the museum.

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It is a document containing information on the Standard Operating Procedure to be adopted in an emergency due to any disaster. By its comprehensive nature, it saves the time used in thinking in emergencies. With training drills it ensures quick response of the people involved. It does not respond to emergencies – it is people who do that. It ensures that staff is familiar with the plan and their roles in it, and that they have the resources, training, and authority to undertake their duties and responsibilities. This information has to be made up-to-date and the Plan practised regularly. Emergency preparedness does not stop once a written Disaster Management Plan is completed.

Disaster Response Team

Disaster Response Team should be organised in the institution. It should have the co-ordinator, Conservator, Civil Engineer, Electrical Engineer, Fire Officer, Revenue Officer, Police Officer, Health Officer etc. They should be given specified duties and meet regularly to review the situation in the institution.

Duties of the Disaster Response Team

The duties of the Disaster Response Team are multifarious. They are

* Declaring emergencies and implement the Emergency Plan
* Implementing evacuation procedures
* Contacting emergency services {fire, police, ambulance) and utilities
* Establishing a command post, chain-of-command and reporting procedures

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* Accessing and stabilise the environment
* Assessing emergency services, supplies and equipment
* Obtaining emergency services, supplies and equipment
* Ensuring the safety of staff and volunteers at all times during emergency
* Arranging for off-site storage and work facilities
* Arranging the transfer of collections to a safe site
* Recording the movement of collections
* Contacting, deploying and supervising museum staff
* Implementing and supervising salvage procedures of collections
* Contacting, training and supervising volunteers
* Documenting all aspects of the response / recovery procedures
* Signing purchase orders
* Meet with the press
* Preparing post-emergency reports.

Emergency Plan

I. Authority Statement

When there is a disaster, the Head of the Institution authorises its staff, employees and volunteers to meet the emergency. The head of the institution's Disaster Response Team is vested with the authority to declare a state of emergency and to use appropriately whatever resources are necessary.

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II. Policy Statement

During a disaster, the museum declares its priorities to be

1. Protection of life
2. Protection, recovery and stabilisation of the collection of records.

   For achieving this alone, it authorises the bypassing of normal procedures.

III. General Instructions

1. Wherever necessary, visible emergency exit signs must be posted clearly.
2. On hearing an alarm or information from the staff all persons shall evacuate the museum buildings.
3. Copies of the Emergency Plan should be available readily for the Disaster Response Team.
4. The Disaster Response Team has authority in all practical matters for the duration of the emergency.

Appendices

There shou1d be details of information as required below to take swift action during any disaster.

1. Complete staff list with addresses and phone numbers
2. Emergency Response Team call-out list with phone numbers (Check weekly).
3. Public emergency services phone numbers (Check annually).
4. Phone and fax numbers, e-mail IDs of other sources of emergency support and appropriate Public Works authorities (Check annually).

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5. Phone and fax numbers, e-mail IDs and addresses of local suppliers of equipment, materials, freezing services, ambulance, accommodation and services that might be required (Check annually).
6. Building information, with plans showing location of water, electrical, gas and compressed air circuits and all switches and cut-offs (Update annually).
7. Lists of emergency equipment and materials held in stock with quantities and location (Check stock and update monthly).
8. Lists and locations of fire fighting equipment and first aid supplies (Check monthly and update monthly)
9. Location of safe copies of Collections' Records and Disaster Plan.
10. Distribution of Disaster Plan and Appendices: I, II & III to all staff; III points 1 and 2 in every room, Appendices 2 and 3 beside every telephone.

Signature of Head of Institution & Date

Checklist

A checklist is a must to assess the condition of the damage occurred to the property. A Conservator may be summoned to advise, if necessary. There are many conservation procedures to rescue the affected manuscripts and art objects. Curators, Archivists, Librarians and the Collection Managers, Keepers, Caretakers etc., concerned may contact the suitable persons for the conservation of affected objects after the recovery of the objects is made.

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Emergency Contact List

State Emergency services	Name	Phone Number
Fire Service	Fire	101
Police	Patrol	100
Police	Traffic	103
Ambulance	Ambulance	102
Hospital	Medical Officer	
Tahsildar	Revenue	
Electricity Services		
Corporation or Municipality or Town Panchayat	Health Officer	
Metropolitan and Water Supply and Sewage Board Head Office Complaint Cell		
Public Works Department	Assistant Engineer (Civil)	
	Assistant Engineer (Electrical)	
Regional Meteorological Centre	Area Cyclone Warning Centre	
Insurance Company		
Police	Technical Services & Finger Print Bureau	
Diffusion Squad		
Pest Control		
Transportation		
Secretariat	Secretary of the Concerned Department	
Head of the institution		

Officials of the Museum

The Chennai museum has got the response team to handle the disaster management. Regular fire-fighting drills and discussions with officials of the fire and rescue services, police department etc., are conducted to contain the disasters.

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Fire

Fire is one of the devastating agencies in museums and similar institutions, where organic materials such as manuscripts, textiles, art objects, natural history specimens are present. One must take all precautionary measures to contain fire thereby avoiding fire. One must know the elements of disaster preparedness to avert fire, to safeguard the objects during fire and the salvaging activities after fire. The various elements of disaster preparedness are

1. Before a disaster
2. During a disaster
3. After a disaster

Fire Safety

Fire is one of the major devastating agencies, which completely destroys objects such as organic objects and inorganic objects within a short time. Even metallic objects like lead, tin also will be damaged due to fire. Fire safety is an important aspect to be cared for. In addition to meeting the environmental standards, the institutions like museums, archives, libraries should meet fire safety standards for the protection of the artefacts.

Causes of Fire

Fire in a museum can occur due to various factors. They are:

1. Electrical and mechanical factors-due to failure of air-conditioners, over loading etc.
2. Chemical factors -due to the use of chemicals, paints etc., in the galleries
3. Human factors -smoking, lighting, deliberate firing etc.

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Fire Safety Systems

There are various fire safety systems available. They are Electronic Automatic Fire Detection and Alarm System, Gas Based Automatic Fire Detection and Extinguishing Systems (CO_2 / FM 200 / NAFS III / INERGEN Flooding System), Automatic Sprinkler System (Wet Pipe-a wet pipe system is one in which water is constantly maintained within the sprinkler piping. When a sprinkler activates this, water is immediately discharged on to the fire, Dry Pipe-a dry pipe sprinkler system is one in which pipes are filled with pressurised air or nitrogen, rather than water and Pre-action-this type employs the basic concept or a dry pipe system in that water is not normally contained within the pipes, the water is held by a pre-action valve), Medium Velocity Water Spray System, High Velocity Water Spray System, Low and High Expansion Foam System, Fire Hydrant System (Both Wet Riser System and Down Comer System), water mist (one of the promising technologies involves the use of fine water droplets, known as micro mist. Micro mist systems discharge limited water quantities at very high release pressure of approximately 1,000 psi. This produces droplets of less than 20 microns diameter, resulting in exceptionally high efficiency cooling and fire control with significantly little water.

Halon 1301 (CF_3Br) fire suppression systems found quite wide application in parts of libraries, record storage facilities, museums and the like. Due to its high atmospheric ozone depletion potential, Halon 1301 is no longer available for fire protection purposes. Available alternatives include NAFS-III (a blend of hydro chlorofluorocarbon s), FM-2000 (heptafluoropropane, CF_3CHFCF_3) and the inert gas system, INERGEN. INERGEN may well serve as an environmentally

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acceptable alternative to Hal on 1302 for critical parts of library facilities.

INERGEN (derived from the words "INERT" and "NITROGEN") is a mixture of nitrogen, argon and carbon dioxide. The specific gravity of INERGEN is 1.05, which is similar to air and therefore human beings could safely remain in the room during trial operation or during accidental release of INERGEN. Of course one should leave the room when fire is involved-not because of the extinguishing agent, but because of the toxic gases released by the fire.

Automatic sprinkler systems (wet, dry or pre-action) represent the preferred protection for libraries and, in the present state of development, are virtually failure proofs. Fire detection and alarm facilities are the next Choice and, again the current technology provides very easily warning (and summoning of the fire brigade) with much improved resistance to false alarms.

Clean agent systems, including the new breathable artefacts and documents and suitable for many parts of library installations. The fire protection technology is available-all we need is more dialogue between library / museum administrators and fire protection engineers.

In order to avoid flood water, the drainage system in the campus is improved recently. The buildings are at high level at least 3-6 foot above the ground level in the area.

Earthquake

In an earthquake, the ground movement seldom causes death or injury. If the museum is a high-raised building, damage will be large. Most casualties occur from falling objects or flying building materials such as broken glass or

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dislodged bricks. Fire can occur due to electrical short circuiting or chemical spills. Water damage can be caused by burst pipes. Showcases, open exhibits will fall. Glass Show cases may be cracked.

If an Earthquake is Occurring

- ♦ Human safety is the first priority
- ♦ Take cover in a supported doorway or under sturdy furniture
- ♦ Stay away from glass windows, doors, display cabinet, bookcases
- ♦ Do not have sharp tools in hands.

After the Earthquake

- * Be prepared for after shocks
- * Extinguish all fires with the proper type of fire extinguishers
- * Contact Emergency services (Phone No.)
- * Check for broken water pipes, shorting electrical circuits
- * Turn off all water at main values
- * Water leaks. Turn off all electrical appliances at the power point
- * Open doors carefully and watch for falling objects
- * Carefully move outside and away from the building
- * Do not re-enter the building until instructed by emergency personnel.

No measures have been taken in this museum to contain earthquake, as this area is not prone to earthquake.

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Bomb Threat

Bombing is nowadays quite common in public offices by the miscreants to achieve their goal. Therefore it is essential to check the entry of the miscreants with bombs in any public-place where public movement is noticed at large. Metal detectors may be used to check the entry of unwanted metal materials, thereby the entry of lethal weapons along with the bombs are avoided.

Security check is made every day and no large baggage is allowed inside the museum. Surprise checks are made in the gallery. Vehicles are not allowed near the galleries.

Thefts and Burglaries

Taking proper control measures may prevent thefts and burglaries in museums. They are both manual and mechanical including electronic.

The preventive measures are manual, mechanical and electronic. The Government Museum, Chennai has got the provision of preventive measures to avoid theft, burglary etc. It will get Electronic methods with a modern Control Room, alarms for important artifacts, galleries etc, connected to a computer which will record all persons and events.

Manual Methods

This museum has got an internal security of gallery guards to guard the objects on display in the galleries. The security personnel are from the department and also from the TEXCO. The external security is both of the departmental staff, TEXCO and the State Police. There is a Police Out-post to guard the campus round the clock. The compound wall is raised to avoid scaling of the walls. There is only one entry/exit to the museum. To avoid the entry of anti-social elements to the campus, an entry ticket of Rs. 2/- is levied per head.

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Electronic Methods

The Government of Tamil Nadu have sanctioned Rs. 83 lakhs to instal electronic surveillance system in the museum. This will have cameras to detect any unwanted occurrence in the galleries, glass breaking of showcases, fire and smoke detection etc. This work has been entrusted to ELCOT. This includes automatic sprinkler system and alarms to tackle fire, theft etc.,

Training the staff

Training is the process of changing a given behaviour to a desired behaviour. Training is important because of the following reasons:

- Trained manpower is not easily available in the market.
- Training condenses the experiences that others have gained over several years.
- Training removes the anxiety of workers as to whether they can do the job successfully.
- Training helps the institution to have a well-co-ordinated team.
- Training helps to equip a person to do the job in the shortest possible time.

A balanced training programme develops in persons knowledge, skills and attitude.

Effective training programmes for those who work in museums are fundamental in ensuring that our museums are equipped to face the challenges of them. Since everyone has a role in the success or failure in the disaster management of

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a museum, training is essential. Training should not apply just to junior staff. Junior staff must be given long detailed training so that they will pick up the subject very well from the beginning. A short-term training should be given to the experienced staff members at regular intervals so that the modem trends will be taken care off. Many directors and senior staff urgently need to acquire improving management and financial staff and it should be just a one-off, but should combine any necessary throughout an individual's active career.

In the Government Museum, Chennai training is regularly given to the staff in fire-fighting. Museum Fire Safety Day is celebrated annually. The fire safety equipments are, refilled and training is offered to fight against fire with the help of the Fire and Rescue Services Department. Besides this, the staffs are trained in museum upkeeping and maintenance of the museum so that disaster management is easy for the museum administration.

Tackling a Fire

There was a fire on 21st December 2000 in the Museum Theatre which is an exquisite heritage building modelled on the old Globe Theatre, London. It was built in 1896 AD. This fire was put out in 30 seconds as the gallery guards and theatre personnel had been trained only a week earlier in putting out fire using fire extinguishers. Only the old velvet cloth screen was damaged.

Recently, we have conserved the theatre by water tightening the roof, the stucco work on the comices and walls, replastering, stained glass, refurbishing the seats, lighting, flooring etc., so that windows, it look a grand sight. The

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151st Anniversary Celebrations of the Museum was held on 19.6.2003 at which the President of India, the Governor, the Chief Minister and others participated and praised the Conservation and refurbishment work.

Conclusion

Whatever may be the system adapted to avoid disasters, it is essential to monitor and review the position regularly. The success of disaster management depends on the involvement and dedication of the staff of the museum. 'Eternal vigilance is the price of Freedom and preservation of artifacts and heritage'.

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DISASTER PLANNING AND MANAGEMENT

Satish C. Pandey

The discussions about the disaster and their prevention have around for a very long time. The basic elements of disaster prevention are the part of everyday action of human community. Regular house maintenance and insurance, knowing what precious things to be saved in case of emergency, maintaining. contact details of emergency help lines like fire or medical services- all these are part of disaster prevention and preparedness. In the context of museums and cultural heritage, disaster preparedness has taken a more formal role in good museum management but the principles remains the same i.e. to save, to protect the collection and the people, both the employees and the visitors.

Various disastrous events in the past throughout the globe have shown the world the benefits of planning and preparedness for disasters and this approach is evolving very rapidly. Although the disaster planning has come a long way in many countries, it is still the unfortunate situation that many museums in India do not have a useful disaster management plan.

This workshop is aimed at assisting museums and cultural institutions in writing their own disaster management plan and this paper portrays a basic framework of disaster management plan.

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Disaster Management Plan

There may be many possible layouts to prepare a good disaster management plan provided that all the basic elements are included and systematically structured. There are three different phases of disaster management, containing various basic elements: pre-disaster, during disaster and post-disaster. Based on these phases, a disaster management plan can be divided into three different parts: Disaster Preparedness Plan, Disaster Response Plan and Disaster Recovery Plan.

A disaster management plan can only be implemented successfully if it is supported by management. There shall be policy decision at national level to provide recourses developing and maintaining a management plan and allocate physical and financial resources to deal with emergency situations. While deciding a disaster management policy, the resources available with the other organizations in the local area network and support of State and Central Government need to be identified and appropriately included. The policy should also ensure that all the resources are provided in proper channel and utilised in best possible manner as and when required.

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WORKSHOP ON MUSEUMS AND DISASTERS: PLANNING PREPAREDNESS AND MANAGEMENT

K.Rajaram

At the outset, I thank the organizers for inviting me to the workshop on Museums and Disasters-Planning, Preparedness and Management. The workshop is a very interesting, initiative at this moment in view of our being in the Museum age.

There is a Museum for virtually any subject you can name somewhere in the world. There are Museums devoted to fine art, to the decorative arts, to science, to industry, to technology, to natural history, and to regional history, to automobiles, to aircraft and all forms of transportation, to medicine, to criminology, to clocks and watches, to musical boxes, to costume and textiles, to jewellery, to pottery and glass, to tin, copper, steel. Growing of museums on various fronts though, indeed, a healthy trend behoves on us a greater responsibility to preserve them against potential natural disasters and man-made disasters for posterity.

Protection of cultural heritage against natural disasters falls within the field of conservation studies and prevention of decay and damage is the highest form of conservation.

The objectives of the workshop contain many disciplines and they are so designed in such a way that by discussing

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our problems and submitting to friendly criticism, we would be able to establish communication between each of the separate disciplines working in the field of conservation of historic architectural and museum project.

I am sure that the 3-day deliberations would provide a deep source of experience that will help experts and knowledgeable people in the future to prepare themselves for the kinds of actions they will have to undertake in the event they find themselves in a disaster. This exchange and dissemination of experience and information in protecting the elements of heritage from destruction and in facilitating their salvage, conservation and reconstruction.

I will touch upon some of the measures we have taken in Pondicherry, in conserving the heritage site, architectural building and the artifacts in the museum.

For the first time, we organized a "Heritage Summit" in February 2002 at Pondicherry for the preservation of our cultural Heritage of Pondicherry, Shri Jagan Mohanjee, the Union Minister of Tourism and Culture who inaugurated the summit took keen interest on the following:

1. Preservation of Arikamedu site – An Indo Roman Trading Centre from 2nd Century B.C. to 2nd Century A.D.
2. Preservation and conservation of heritage buildings.

"Arikamedu" a coastal village on the Bay of Bengal, is 8kms. south of Pondicherry. It was natural harbour some 2000 years and it had trade relations with the Romans from 2nd Century B. C. to 2nd Century A. D. There was Roman factory at the site as is evidenced by a ware- house, dying watt, Roman Pottery (Rouletted ware) and a bead factory, a few amphora jars associated with the Romans. All the findings are now housed in the Pondicherry Museum.

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Considering the historical importance of this port city, the Archaeological Survey of India has declared it a Protected Site of National Importance in the year 1982. The total area of the declared site is 13.99 Hectares. Though the site was declared as protected one, the lands included in it belongs to the various private parties. With a view to protect the site from being put to vandalism or despoiled, action was taken to conserve the site by this Administration.

It was decided at a high level meeting to make arrangements to acquire the Arikamedu site by the Archaeological Survey of India and prepare master plan for its all round development with preference for a site museum there. Arrangements are underway to acquire the site. We do hope that days are not far off to see the Arikamedu site in all its resplendent glory thanks to the efforts of the Heritage Summit 2002.

Pondicherry is a town, planned on grid pattern in oval shape and has two quarters, the French and Tamil. The French quarter has structures in the European classical style and the buildings in the Tamil quarter has a strong vernacular influence of surrounding Tamil Nadu. The Two styles have complemented each other with the result that many buildings in both parts of the town are a blend of European and Tamil architectural patterns.

Lack of understanding and appreciation of the architectural character is leading to demolition of valuable buildings that disturb the harmony of the traditional streetscape.

With a view to create an awareness of the rich art, cultural and environment we have inherited and to instill a sense of responsibility to the future generations to whom we must pass on not only the monuments, buildings, sculptures and paintings but, centuries of experience and tradition required

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to maintain and create the beautiful environment we live in, it behoves on our part to take up conservation measures for the preservation of priceless heritage.

With this end in view, a conservation cell has been formed by involving INTACH and Town & Country Planning Department. Yet another outcome is that a MOU is on the anvil between this administration and the INTACH. With the signing of MOU, it would be possible to initiate action for the conservation of heritage buildings in the Union Territory of Pondicherry.

The Union Territory of Pondicherry, thanks to the support of the European commission through the Asia Urbs programme got 50,000 Euros (nearly Rs.25 lakhs) for undertaking the well targeted activities connected with the heritage of Pondicherry, under the Asia Urbs Programme, facades about 20 heritage houses will be restored during 2003 -04. Yet another important activity is to renovate and. restore the old lighthouse and its complex, which was more than 100 years old, and plans are afoot to convert into a cultural activity centre.

Apart from the renovation and restoration of the architectural buildings in Pondicherry, we have taken action for restoration of bronzes in the Pondicherry Museum. The bronze collections in the Pondicherry Museum are superb and as per the opinion of an expert, our Chola bronzes are the third best collections in the world. We have no conservation Laboratory in the Museum. But with the help of restoration team from the National Museum, New Delhi, we have conserved the bronzes and put on display with modern lighting facilities.

The present museum building is a century old one and

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there is dampness on the surface of the walls and as the presence of dampness is injurious to the objectives on display, action is underway to make the surface of the wall damp free by providing special coating throughout the building.

With the active support of INTACH and other like minded team, we take all preventive measures to minimize the disasters thereby preserving our cultural 'wealth of the country for Posterity.

I wish the workshop all success and I am sure that the deliberations would be a fruitful one for the preservation of our cultural heritage and serve as a guiding factor to the custodian of art treasures.

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MUSEUM DISASTER PLANNING, PREPAREDNESS AND MANAGEMENT

S. Sethuramalingam

Disasters can occur at any time in any place. Museums are not immune to that. Soon after the international decade for natural disaster reductions (1990-2000), there has been an awakening during the recent past and when W.T.C disaster happened, it became the icon of the subject. In the disaster management, a paradigm shift has been noticed globally from post-disaster recoveries, rehabilitation to proactive initiatives. Yokohama May 1994 proposal throws more light on this subject throughout the world. Coping up with disasters is an art as well science. Likewise, earthquakes cannot be avoided, but the death tolls could be.

Flood, draught, fire, earthquakes, hurricanes, tornados, winter storms, pseunamies, wars, terrorism, social unrest, bomb and explosions are identified globally as the causative factor for disaster. Though people were the worst affected, most often, the damage to cultural and natural heritage centres like museums, archives and libraries are felt as severe and non-recoverable. Management gurus advocate preparedness, planning ahead and policy making in advance to limit the damages.

With the growing importance of museums as the non-

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formal education centres, disaster management in museums especially Natural History Museums gain wider acceptance and priority. In this presentation, planning, preparedness and managerial aspects at Regional Museum of Natural History, Mysore has been considered for the case study. It is recommended that disaster prevention, mitigation and preparedness are better than disaster response. Disaster response alone gives only tentative relief at a huge big cost.

What is Disaster ?

A disaster is an event of nature or man made causes that lead to sudden disruption of normalcy within society, causing damage to life and property, to such an extent that normal social and economic mechanisms available are inadequate to restore normalcy.

Disasters in India

With its wider land area, exploding population and very unique tropical geoclimatic conditions, India is open to disasters naturally. The effect of Pseunami (tidal waves) during 1936-42 at West Bengal, the impact of World Wars at places like Chennai, the toll of earthquakes at Chamoli, Garwal along the Himalayan region during last decades, the unforgettable occurrence of Bhopal Gas tragedy (1984), the loss of lives caused by the nature's fury at Lathur (Maharashtra) during 1992, same but more magnified at Bhuj (Gujarat) during Jan.26, 2001 are the few. The recent happening in Aksharadam temple, Gateway of India and Jawari Bazaar, Mumbai give us alarming signals to protect our natural and cultural heritages. Vide the table-I for more statistical details.

Our natural heritage at our museums are now expected to solve many of the biological as well genetical issues in the

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history of mankind. The well-preserved museum specimens are now world wide becomes the source of genetic studies and museums become the repository of genetic materials. It is important equally to recollect the natural disaster like the flood, which ravaged Kaziranga, the rhino sanctuary (1986), the devastating forest fire at Nagarhole (1992) and the killer epidemic F & M, which wiped largest Gaur population at Bandipura (1986) and the mass epidemic caused death of precious white tigers in flood affected Nandan Kanan Zoological garden at Orissa. Similarly, oil spill in oceans around India and nuclear leaks from unknown sources in our territory can also cause disasters.

Case Study

Regional Museum of Natural History (RMNH), Mysore is located in the cultural capital of Karnataka, at the bank of Karanji tank along the foot hill of Chamundi Hill, where domestic and international tourism potentials are very high. Situated close to the biodiversity hot spot, the western Ghat, the RMNH is close to the National Parks and sanctuaries, like Bandipura National Park, B.K. Hill sanctuary and Rajeev Gandhi National Park.

The world famous heritage sites like Jayachamaraja Wodeyar Palace and Jaganmohan Art Gallery, which host the original Raja Ravi Varma's paintings and Tippu's Summer Palace are located here. Regional Museum of Natural History is situated in a close proximity to all these places. This is one of the public buildings owned by Govt. of India, sprawling 5.23 acres. Since there is no entry fee, it is freely accessible to all. A 17,000 sq.ft. display area on Biodiversity is presently opened to public viewing. The regular indoor and outreach programmes and activities attract thousands of

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visitors daily. Let us discuss a preparedness plan for the disaster mitigation in this museum scenario in this paper as a typical example.

Disaster Threats

The following threats could be anticipated for Regional Museum of Natural History for the purpose of preparation of disaster management programme :

1. Fire
2. Flood
3. Terrorism - Bomb - explosions, WMD, hazardous chemicals, etc.
4. Demonstration - Social unrest - vandalism
5. Earthquake
6. War or warlike situations

Fire

Let us remember the latest major fire accident happened at Royal Motor Cycle Museum at Bermingham (U.K.), where 650 heritage bikes were gutted during September 2003. At Regional Museum of Natural History, also the chance of disaster by fire is worst feared. The massive wiring at the showcases, dioramas, working models, interactive exhibits may develop short circuits due to technical reasons like fluctuation in the voltage, mechanical disturbances, quality of the material used or by the nature of temporary connections. Most of the natural history museum exhibits and taxidermic preparations are vulnerable to fire because of their biological origin. The management programme suggested below is applicable to similar kind of museums, archives and libraries found elsewhere.

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Management

1. Contact fire service
2. Use extinguishers
3. Don't allow fire to come between you and exit
4. Disconnect all electrical equipments.
5. Call the caretaker
6. Don't break windows or open hot doors – ventilators
7. Forget personal belongings
8. Reach directly the assembly area.

Programme during disaster

At RMNH, first gallery is situated at ground level and evacuating the public is comparatively easy. During emergency, doors/shutters at end of first gallery, level gallery, door leading to office side, door at the southern side of discovery centre could be quickly opened. Reserve collection area, open diorama 'going going gone' exhibits may be accorded top most priority for protection and salvage by the rescue operators because of the rare mammalian specimens. Disabled at cave should be taken care. As said above, the other museums could also adopt the similar kind of evacuation operations during the fire disaster as mentioned above. The water stored in the overhead tank, water from bird watching tower, circular pond and water from Karanji lake could be drawn to put off the fire. All the extinguishers could be easily handled.

Preparedness

The disaster programme manager should periodically notice the expiry of extinguishers. He should develop a good

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liaison with the local fire fighters. Evacuation of staff as well as visitors must be thoroughly rehearsed. He should exercise precautions with the already prepared vulnerability assessment of the museum exhibits. Usually, the Caretaker and Security Officer can take care of this preparedness part.

Flood

Flooding would be devastative for the institutions like libraries, archives dealing with mainly paper manuscripts and paper mache models. Likewise, labels and artifacts made up of paper and paper mache at any museum would be destroyed by flooding. RMNH is located at the bank of Karanji tank in a low-lying area. There is a possibility of this kind of disaster soon after heavy monsoonal rains, during which the feeder channels bring storm water as well the excessive sewage to the tank. When the rainfed tank overflows beyond its holding capacity, the flooded water may cause disaster at RMNH campus. Since there is no paintings on the external walls and there is no outdoor exhibits, peripheral damage would be minimal. Water enters inside the gallery and may play havoc. The dampness would promote the growth of fungi and mould that may set biodeterioration of artifacts of organic origin, also, the basic structure of all wooden showcases. One of the NCSM's Science Centre at Tirunelveli faced the worst situation much before its inauguration as the centre is located on the bank of a perennial river Tamirabarani, during last century.

Management

1. Evacuate the public
2. Secure cars parked in the parking area
3. Store or save drinking water sources

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4. Keep ready first aid, emergency lights, blankets.
5. Close windows and disconnect power

Salvage - restoration

All the wet papers and specimens can be kept in the fridge and freeze drier can be used. Control the humidity of the gallery by using dehumidifiers. Not allow RH above 65% during restoration. To keep yourself from microorganisms, use filter respirator and hand gloves. By smelling the musty odour, fungal infestation can be detected. Test with U.V light source. Mark the luminescent area for treatment. Regulate the temperature between 18-20° C. Store the object in acid free paper packs. Use vacuum cleaner, drier, dehumidifiers and silica gel.. Contact the conservator. Don't keep canvas, textiles in sealed plastic bags. Refer A.I.C's salvaging water damaged textiles. To save your computer, CDs, floppies from flood effect, call the e-media conservators.

Preparedness

Following the weather bulletins from the radio and other electronic or print media, take precautions well in advance. Arrange alternatives when there is a utility failure. Keep ready raincoats, plastic sheets and other water proof materials ready. Keep in touch with local administration for arranging relief materials. Also, prepare for the challenges from reptiles and other dangerous organisms drifted by flood water into the heritage sites. Engage a trained person to handle these animals. Keep ready all battery operated energy sources.

Terrorism

At this juncture, preparedness against terrorist attacks need to be considered seriously since at almost all the places across

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the country face threats. Frequent attacks and cross border terrorism reported at Kashmir, Mumbai, Gujarat are awakening call to all museums, libraries, archives, natural and cultural centres and their custodians or curators.

RMNH is one of the prestigious southern regional centres for Natural heritage. Drawing every day few thousand visitors from all walks of life and the Mysore city draws 5 lakhs visitors per annum. It is one among the most happening place in the Mysore City filled with film shows, programmes and workshops. As the city has already received threats, the locality of RMNH and its 5.23 acres sprawling campus need to be carefully studied for any such possibilities. More than 200 fully grown trees, model forests, herbal, rock gardens may also be said as the ideal hideout - cover. Also, it is flanked by residential colonies on 2/3 of boundary. Southern gate is located at the bank of Karanji Lake, which has access with many main roads.

Preparedness

Knowing the vulnerability, the security and staff must be vigilant and alert. CCTV should be installed at vantage points. Library and other cupboards, book storage cabinets in the office must be shifted elsewhere because there is a huge water tank (14.25 X 14.5 X 6.5 ft.) above the office floor has been identified as vulnerable for terrorist attack.

Explosion

Management

1. Contact security and emergency prepared official
2. Take cover under table, desks , expect more such.
3. Inform the local authorities in details like threats and stay indoor

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4. Don't go near windows/door, mirrors, overhead fixtures, filing cabinets
5. Call evacuation co-ordinator, ambulance
6. Don't spread rumours or re-enter the area.

Bomb Threats Preparedness

1. Be calm. Listen to the caller – keep talking to collect more information.
2. As the caller hangs-up, immediately notify.
3. Soon prepare the bomb threat check list, use public address system to evacuate the visitors. Evacuate only when directed.
4. Keep the vehicle ready for use.

Let us recollect the impact of war, bombing, explosion, vandalism at Iraq's National Museum at Baghdad, Iraq during 9.4.2003, the fall of Saddam Hussein. This museum reportedly has lost 13,000 pieces as per D.G. of Antiquities.

Salvage and restoration

Contact the builder to rebuild and conservator to restore. Arrange medical care. Protect the artifacts. Gear up photo-documentation – invite the restorer. The manager – protection, has to safe guard the properties after this kind of attacks.

Social unrest or demonstration

At any place now-a-days, the vandalism during social unrest or during demonstration is very much possible under the current political, socio-economical scenario. Most of the museum including RMNH has been constructed with glass walls and see through entrances. It is going to be

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disastrous when these glasses are damaged by the act of vandalism. Gallery may become like an open-air museum subjected to rain and shine. The security and safety of the object would be jeopardized, especially in museums, the discovery area, computer centre, foyer area, main entrance and auditorium area.

Management

1. Notify the law and order authorities factual or rumoured information received.
2. Take care of building security, stay indoor, evacuate when direct.
3. Don't strike a dialogue with agitators, keep ready the first aid materials.

Preparedness

Various size and thickness of float glass sheets, tapes, adhesives may be kept ready. First aid box with necessary antiseptic should be kept ready.

Earthquakes

India is one of the most disaster-prone countries in the world. The disaster-prone states are as mentioned below by Building Material Technology Promoting Council, (BMTPC), New Delhi.

1. Andhra Pradesh
2. Assam
3. Bihar
4. Gujarat
5. Madhya Pradesh

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6. Maharashtra
7. Orissa
8. Rajasthan
9. Tripura
10. West Bengal

Though Karnataka is not in the disaster-prone notified area, there were few occasions, minor tremors at a lower Richter scale has been experienced. Mysore needs little attention in this regard. It is located 21 kms. away from the irrigational largest dam 'Krishna Raja Sagar' whose holding capacity is 124 ft. Modern Seismologists warn any area near big dams and reservoirs as earthquake-prone areas. Besides, RMNH building height is not above 40 ft., having only one floor. Also there is no high-rise building nearby. Evacuating is easier since this horizontal building has many exits. Only requirement may be off-site building to store valuables. There is no cellar or below the ground level rooms which are earthquake prone.

Management

1. During the shaking, stay there if you are inside the galleries.
2. Take cover under furniture like desk, worktable etc. and go to the centre of the building.
3. Don't use lifts. Stay away from glass topped showcases
4. Don't use gas lighter or match sticks. Close the doors and windows to prevent the entry of dust.
5. If you are outside the museum, move far away from any building, electrical wiring, tall grown trees. If you are in

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your car in the parking area of the museum, remain inside the vehicle and look for the falling objects. Save food, water. Use battery operated light and communication sources.

Preparedness

This would be exhaustive. Use the template for telephone number, medical aids, rescue teams, generators, earth movers, respirators and arrange to get help from local administration. Battery operated communication system is a must. Logistics and supply line is very important. Off-site building should be used to keep the valuables.

Salvaging and restoration

1. Plaster the cracks, crevices developed.
2. Scan and protect the valuable in the debris.
3. Bring back the material from off-site storage.
4. Use vacuum cleaner to dust the objects.
5. Replace the broken windows.

Preparedness

Time, date, place of occurrence of earthquakes cannot be predicted. Hence, planning for the disaster and drill by the programme manager regularly would be helpful. Reviving the communication net work is the priority task. Follow advice of building material and technology promoting agencies to restore damaged museum building. The drill or exercise by the programme manager would be very useful.

General preparedness

In India, except flood, fire, earthquake, terrorist threat, explosion, there are no other disaster causing agents like

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severe storm hurricanes, tornados, winter storms, utility failures, hazardous material accidents or transportation accidents within museum premises are anticipated to occur in the developed countries.

Museum curators may study the various disaster-prone aspects in their museum and prepare a management plan. During the disaster, usually the institutional manager authorizes the disaster programme manager to do the entire operation in the affected area. The protective manager of the institution would take care of security of the people, properties and building. Usually, institutional manager give such responsibility to his immediate junior level officer as the Disaster Programme Manager. This DPM will prepare the entire plan and discuss with other members of staff and make them familiar with the written plans.

Another very important aspect during disaster is command and control centre and logistic supply chain. It must be clearly defined and discussed beyond iota of doubt. The prepared ness plan include training, exercise, drill, construction of off-site strong room, purchase of equipments, hand-tools, the contents of disaster box, name of the place of such boxes, important telephone no. of fire, police, hospitals and volunteers. Also the plan should specify whom should be contacted after working hours and holidays or when the institutional manager is not in the station. This general rules are applicable to all museums, libraries and archives.

Strategies, recommendations and action plan in general

Strategies

1. Identification and mapping of disaster prone areas.
2. Vulnerability and risk assessment of institutions like

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museums, archives, libraries, their building, proprieties, exhibits, etc.

3. Planning, budgeting, funding, prioritizing - template.
4. Group linking – liaisoning various institutions to work together including funding agencies.
5. Awareness among communities, N.G.Os and media.

Recommendations

1. Focus on prevention and pre-disaster stage.
2. Develop database.
3. Create more institutional mechanism.
4. Capacity building in assessment, operations, programming, drill.
5. As a thrust area for funding and R & D works.
6. Create awareness among various stakeholders.
7. Logistic – decisive supply line.
8. Network communications.

Conclusion

Central and State Governments are now evolving strategies, policies and programmes in the area of disaster management. With the application of I.T tools like satellite data, remote sensing informations, computerized risk analysis and mapping, it is believed that most of the disasters could be minimized in future. It is equally important to consider mapping, capacity building, better institutional mechanism and adequate funding to save cultural and natural heritage. All the State Governments may realize that they are the major respondents. They may responsibly organize disaster

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response mechanisms more effectively. Coming to the role of museums, archives and libraries in preparedness, atleast now they realize the importance of accession, maintenance of acquisition register and completion of inventories, which has not been seriously attended so far ! Finally, let us think about the positive side of disasters also ! After 9/11, the lower Manhattan population at U.S.A started to understand humanism much better than never before and started to 'live-life to the core'. Similarly, it is observed that population of Hawaii Islands (Honolulu), U.S.A, are better dancers and live merrily because of earlier disasters !

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TABLE - I a, b, c, d

a. INDIA

DISASTER LAND AREA	VULNERABLE
Earthquake	54%
Cyclone	8%
Flood	5%

b Earthquake

IMPACT	INTENSITY	MAGNITUDE
Severe	MSK IX	12%
Medium	MSK VIII	18%
Small	MSK VII	25%

c

PERIOD	COAST	CYCLONE FREQUENCY		DEATH TOLL
		Occurrence	Velocity	
1891 to 1990	East	262	50 Km.	
	West	33	Less than 50 Km.	10,000 lives

d

DISASTER IMPACT	
Houses/buildings Damaged	1 Million
Lives lost	1.25 Million

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MUSEUM DISASTER MANAGEMENT
PLANNING & PREPAREDNESS
MITIGATION

EMERGENCY PROGRAMME PLANNING
COMMAND AND CONTROL LOGISTIC, SUPPLY CHAIN

FINANCIAL SUPPORT
(WELL IN ADVANCE, DISASTER BOX - COMMUNICATION EQUIPMENT)
OFF-SITE BUILDING

EMERGENCY PROGRAMME MANAGER
HIRE OR HOD OR NO.2 INTER-DEPT. CO-ORDINATOR

DRILL THE STAFF PERIODICAL REHEARSAL

GROUP LINKING
LOCAL ADMINISTRATION, CONSERVATORS

AWARENESS
STAFF, NEIGHBOURHOOD, NGO, VISITORS

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Type of Disaster/Incident	Ministry / Nodal Agency
Air Incident	Ministry of Civil Aviation
Civil Strike	Ministry of Home Affairs
Rail Accidents	Railways
Chemical	Environment & Forest
Nuclear	Atomic Energy
Natural floods /Cyclones/ Earthquake	Ministry of Agriculture (IMD, CWC)

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DISASTER MANAGEMENT GUIDELINES FOR HERITAGE MONUMENTS

Jenee P.

Abstract

This paper discusses the guidelines for disaster management of monuments. Monuments form a major part of India's cultural hertage.The paper emphasises the current scenario of monuments in India and discusses monuments which also serve as museum buildings or other cultural institutions.

Introduction

Disasters are unexpected events that occur suddenly and have a catastrophic consequence. Both the movable and immovable cultural property can be damaged in disasters. Its economic ramifications include less tourist flow to the monuments. However most of the institutions handling monuments in India have no clue of the possible disasters and risk factors have not been assessed. The reality struck the cultural connoisseurs of the country in the wake of the Gujarat earthquake in 2001 that damaged and destroyed monuments at Bhuj, Kutch, Ahmedabad and the Jasialmer. Following this, a Disaster Management Plan was devised by the Central government and plans are in the offing to bring monuments under this plan.

Disasters can be both man-made as well as natural. Natural disasters include earthquakes, flash floods, cyclones,

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landslides, volcanic eruptions etc. Man-made disasters include communal riots, wars, theft, fires, vandalism, nuclear fall outs, chemical spillage etc.

Disaster Management

Disaster management means anything that can be done before, during or after a disaster strikes. Disaster management includes a) disaster preparedness, b) disaster response and c) disaster recovery. Disasters are a) inevitable, b) sudden, c) damaging. Hence there should be a multi-pronged strategy. These strategies can be Short-term, Medium-term and Long-term. The ultimate goal shall be to integrate cultural heritage into the existing disaster management plans of each country.

Disaster management in the case of movable cultural property has been compared to the monuments which are immovable. Disasters are bound to occur at some point of time and hence planning and preparedness should be a priority over recovery.

Significance of Disaster Management

Heritage can be classified into natural heritage and cultural heritage. Cultural heritage has been identified as a non-renewable and irreplaceable resource by UNESCO. Hence, disaster management was made a part of the ICCROM courses since 1994. It covers various aspects such as a) training, b) education, c) technical assistance and d) integration.

However, the policies drafted by these international bodies have to be made feasible and viable at the local levels with local participation under expert guidance. Various guidelines have been drawn regarding the protection of monuments in the wake of disasters and are as follows.

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- Disaster management should be integrated into cultural resource management
- Multi-pronged strategy is required to tackle damage due to disasters.
- The disaster management plan should be region- specific and flexible and ensure public participation.
- Steps should be taken to develop necessary infrastructure in institutions that handle monuments in case of a disaster.
- Provide training to staff or personnel in charge of the museums.
- Categorise monuments into various cultural zones.
- Appoint disaster managers in each cultural zone.
- Create an international network for the exchange of information and expertise.
- Collect a special tax for disaster management in each monument from the visitors.
- Seek the help of private firms in funding.
- Provide public education and awareness through the already existing institutional network, media etc.
- Frame relevant legislation and advocacy.
- Create an inventory of monuments of national, international and local levels.
- Identify the potential disasters in each region and make a risk assessment report of each monument and site.
- Periodic maintenance of monuments as part of disaster preparedness.
- Provide disaster insurance coverage for monuments.

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- Review after the disasters strike otherwise called Impact Assessment.

In the case of heritage monuments that also serve as museum buildings or other cultural institutions, both the monuments as well as its contents need to be recovered. This requires a multi-pronged strategy.

Indian Scenario

Let us review the Indian scenario in this regard. India has a wealth of cultural heritage which is mainly formed of monuments such as Taj Mahal. Of these, sixteen are declared as world heritage monuments by UNESCO. The archaeological survey of India protects 3606 monuments and around 1400 structures throughout the country whereas thousands of other monuments are protected by the departments of culture and archaeology in each state.

Key Issues in Disaster Management of Monuments

From the above discussion the major issues in disaster manangement of heritage monuments can be categorised as following.

- Lack of planning and preparedness.
- Lack of an inventory of monuments and the potential disasters and the risk assessment for weak monuments.
- Lack of awareness and public education.
- Lack of fund prioritisation.
- Lack of trained personnel and technological expertise.
- Lack of a viable recovery plan.

Disaster management plans should be extended to cover cultural heritage sites, structures, monuments, museums, libraries, archives and their contents. Disaster management

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should not be confined to humanitarian and strategic concerns alone but should also have cultural concerns. Disaster management should be made a compulsory component of heritage management both at the national and local levels. The goals and objectives, the action plan and the targeted outcome, as well as the proposed timeframe should be clearly mentioned in the Disaster management plan.

Disaster management has become all the more relevant in the current Indian scenario since a major part of India is prone to natural disasters such as earthquakes. India also has a rich cultural heritage. Man-made disasters such as vandalism and communal riots pose a major threat to many of our monuments and disaster management becomes a major priority in this regard.

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ROLE OF PLANNING IN DISASTER MANAGEMENT OF THE MUSEUMS

Dr. S.Darsana

Introduction

In the age of globalisation, it has become very important to assess the role of disasters in cultural institutions such as museums and other repositories of heritage. The role of museums has undergone changes in the global terrorist context, especially in the post 9/11 scenario. Museums are not only the preserving agencies of antiquities and art treasures, but also the reflection of the culture and heritage of a nation. Terrorists or other elements targeting the cultural institution can be a great source of disaster, as known from the destruction of Bamiyan Buddha and the looting at Iraqi National Museum. Hence, it is imperative to take precautionary measures to prevent such disasters by identifying the probable nature of disasters and having a disaster management plan.

What is disaster

The Oxford dictionary defines disaster as 'an event that causes great harm or damage' to the human beings. The event may be natural or human made. In the context of museums, it can be defined as a sudden and unexpected event that produces damage and harm to the museum building, its collection and its users.

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Disaster Management Plan

Management is the process of getting activities completed efficiently and effectively with and through other people. Regarding the disaster management, management involves the identification of the agencies of disasters, setting priorities and preparing an action plan for the disaster prevention. This can be done at two levels-

- A day-to-day security measures combined with low level technology
- Emergency measures to prevent or at least reduce the intensity of disaster with high level technology.

The main aim of the disaster management is to successfully implement, the routine as well as emergency measures to diminish and prevent any disaster that may strike the museums anytime. "Good disaster response is merely an extension of good, routine, daily emergency procedures." For the smooth functioning of the institution, the disaster management should have the following key items:

- A clear database of the museum
- A smooth administrative machinery to successfully implement the plan
- Access to various resources- both human and monetary, and Project plans

Disaster Planning for the Museums

The most important component of disaster management is to having an effective disaster plan. Planning is the management of the organization's future in an uncertain

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environment. Each museum should have two types of planning:

- **Strategic Planning** for the overall organisation and for a definite period of time.
- **Operational Planning** for day-to-day operations in emergency.

The planning should include the following features:

- Identification of Goals, Objectives
- Selection of Priorities
- Identification of Resources- Human and Monetary
- Budgeting
- Training and Implementation

  In the museum context, there are three planning processes to be adopted. They are

- Disaster Prevention Plan
- Disaster Management Plan
- Disaster Recovery Plan

Disaster prevention plan

Step I. Identification of Goals, Objectives

- To protect the objects from disaster
- To prevent disaster striking at the museums
- To highlight the key aspects of the museums:
- Collections

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- Buildings
- Staff and
- Users

Step II. Identification of the Agencies of Disaster

- Natural Disasters
- Technological Disasters
- Human Made Disasters
- Other Disasters

Step III Selection of Priorities

- Identification of priorities, based on frequency and probability of occurrence
- Making a priority list for the time of disaster. For example, though collections are important for the museums, at the time of disasters such as fire and earthquake, the first priority should be given to human lives.

Step IV. Programme of Action for Prevention

- To identify methods of action to prevent the disasters
- To equip the museums with necessary apparatus to prevent disasters
- To assign responsibilities to an efficient team for operating the plan
- Measures to be taken for the prevention of disasters such as basic routine maintenance tasks

Disaster Management Plan

When the disaster occurs, the museums should be ready

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with management plan and a programme of action to handle the implications of disasters.

Programme of Action

- Equipping the personnel with basic skills (fire fighting techniques)
- Plans describing methods of saving lives (basic first aid and life saving methods)
- Saving the most important valuable collections as identified in the prevention plan.

Disaster Recovery Plan

Programme of Action

Formulations of

- Set of instructions for all the staff to be followed after the disaster
- Resumption of official duties after the disaster
- Salvaging plans of lost objects based on priority list
- Recovery plans through the identification of networks

Disaster Planning: A Few Suggestions

- Creation of a central nodal agency for better coordination and zone agencies for better functioning. The centralised authority would provide necessary unifying guidelines for all the museums.
- Creation of Disaster Management Cell
- To determine the programme of action,
- To plan, organise, lead and co-ordinate

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- To train the museum staff
- To create awareness among the public
- To formulate budget
- To implement the plans
- To train the senior officers of museums as disaster protection managers in time of emergency
- The **Planning Team** should be formed in all the museums to formulate a comprehensive contingency plan.
- A preliminary survey of the museums that includes the building and its collection. The survey should include the condition of the building, status of collections and storage, and collection protection.
- A thorough screening of all the permanent and temporary staff, their past records, and activities.
- Creation of user friendly and threat free environment for the users of the museum
- Creation of awareness among the public through a series of programmes for highlighting the need to protect the cultural institution.

The disaster plan should be written, reviewed and updated periodically for necessary omissions and additions. All the staff members of the museums should be made aware of the plan. With a proper planning, the museums and other cultural institutions can be protected against any unexpected violent actions of nature and human beings.

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DISASTER- PREVENTIVE METHODS IN ARCHIVES

Easwaran P.

Introduction to Archives

Records and documents are the representatives of our rich literary and cultural heritage. They are the vital source of information for the administrators, researchers and scholars. And they need to be preserved for posterity. We cannot allow any part of this heritage to be affected or lost due to any type of agents that may be physical, chemical, biological or disasters. In these categories, the disasters are the most dangerous enemies of the archives and records. Fire, flood, earth quake, war, theft etc. are the major causes of destruction of records.

Identification of disasters

Natural Disasters

Flood

Technological Hazards

Structural collapse

Disaster due to human errors

Theft /Robbery and Vandalism

Terrorism, Fire

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Prevention of disasters

Flood

Inspection of buildings and their locations: This is vital in the case of old buildings housing the archival materials. A few of the archives are situated near the sea and rivers (Pondicherry, Ernakulam). To prevent floods occurring at these places, rising of high and strong compound wall is essential.

Steps should be taken to keep the records on the top floors of the buildings

For building a new archives, it is imperative to select a location away from the possible flood threat areas.

Lightning

Lightning, the most dangerous agent of disaster, causes immediate threat to the archival materials. Setting up Lightning arrest in the archival building will solve the problem.

Earthquake

For the archives already located in the earthquake zone, a contingency plan can be drafted and implemented immediately after the disaster. The duplication of the records can be made and maintained safely elsewhere.

In the case of modern buildings, steps should be taken to house archives in non-earthquake zone.

Wherever possible, earthquake proof structures can be built using the traditional as well as modern technological aspects.

Structural collapse

As most of the archives are located in ancient buildings, it is very important to inspect the buildings regularly. A

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periodic inspection and immediate action against any problems will prevent this disaster.

Theft / Robbery and Vandalism

The buildings should have improved security system. Alarm system can be introduced. The access of users should be monitored through CCTV and wherever possible, access can be limited to the users. A security plan and the implementation of the same are imperative for preventing theft and robbery.

Terrorism

As the Archives are the repositories of valuable records of a country, this can also be the target of terrorism. A strong and vigilant security system can provide a proper protection from terrorism.

Fire

Replacing the wiring system, fire detecting system, fire extinguishers are the most fundamental components in the fire prevention of archival materials.

However, it is very important to conduct mock drills in fire prevention for training and preparing the staff and the users.

Use of gas and other appliances for cooking purposes should be banned in the vicinity of archives.

Highlights

Though most of us are aware of the disasters and preventive measures to be taken, when it comes to facing the disaster, it is essential to practically apply these measures. In this regard, I am highlighting a few points that stress importance of practical staff training and a security policy for the archives.

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Disaster security plan and policies

- ✓ Preparation of a written security policy
- ✓ Appointment of a security manager with sufficient authority
- ✓ Implementation of preventive measures
- ✓ Establishment of rules for the users
- ✓ Establishment of rules for the staff
- ✓ Installation of appropriate security system
- ✓ Implementation of the safety measures in the archives
- ✓ Training of personnel

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EDUCATION AND TRAINING OF MUSEUM PERSONNEL AND THE PUBLIC IN DISASTER MANAGEMENT

Dr. V. Selvakumar

Education plays an important role in disaster management and helps manage the human resources effectively in disasters. Disasters in museums cannot be successfully tackled, without proper education and training of the museum personnel and the public. Disaster preparedness will be incomplete without the training of the personnel. Therefore, an effective disaster management plan should have provisions for training, especially the museum personnel.

Major Stages in Disaster Management

I. Identifying potential disasters

II. Preparing a plan to face these disasters

III. Fixing necessary controls and equipment

IV. Training the personnel to face the disasters

V. Carrying out mock drills to check if the system works

VI. Managing the disasters

VII. Disaster recovery

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Personnel Training Programmes - Nature and Components

Theoretical and Practical Aspects

The training programmes in disaster management should include both theoretical and practical aspects.

Exposing the Complete Plan of Action to the Staff

The museum staff should have thorough knowledge of the potential disasters, steps taken to mitigate disasters, the equipment and controls installed for the purpose and the method of operation.

Holistic Approach

The disaster management plan and training should incorporate the entire staff, right from the curator or director of the museum to the security or sweeper. All of them should be aware of the disaster management plan and be able to operate all or relevant equipment fluently. Even a senior officer should know how to operate the fire fighting equipment. He should not wait for other junior officers to use the fire extinguisher in disasters.

Sensitising the Staff

Sensitising museum staff is essential in disaster management. The staff should be alert when a disaster strikes. They should conduct periodic or daily check before leaving the museum premises. Even a computer left to be on overnight could cause fire.

Roles and Responsibilities

The staff should know their role and responsibilities in case of disasters. They should be clearly told who will do what.

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Communicate and Act

Before trying to tackle the disasters the staff should communicate other relevant agencies and start acting to mitigate the effects of disasters. In case of fire they should inform the fire service and then start acting on their own. If they wait for the fire service personnel to do the job, if could be too late. Or if they act on their own without informing the fire service personnel, that could also be dangerous.

Do's and Don'ts (Guidelines) in the Museum

Communicating the staff and the public about the do's and dont's in a museum is very important. E.g. the staff should know what should be done if the disaster is during office hours or after office hours. These instructions can be given in the form of a booklet.

Essential Information

All the staff in the museum should have certain essential information. This information can be included in the booklet. Here is some of the essential information:

- o Plan of the museum and the galleries. Galleries with sensitive materials.
- o Emergency doors.
- o Location of controls, switches and fire fighting equipment.
- o Important phone numbers of all the employees, fire service, material suppliers, police, etc.

Learn from Mistakes

If a disaster strikes any one institution, it should be made as a learning experience for others. Information about disasters, whether small or big, has to be collected and

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disseminated among the staff to help them learn about the actions and precautions to be taken.

First Aid Methods

The staff should be trained in first aid methods. This will be useful to save lives in disasters.

Professional Training and Hands-on Experience

The training should be given by professionals. For instance, fire service personnel can train the staff about operating the fire fighting equipment and other measures to be taken. The staff should be given practical training in operating the equipment. Physicians can train the staff on first aid methods.

Mock Drills

Mock drills are very important to check if the museum personnel are alert. These drills should be conducted periodically.

Educating the Public

The role of public in disaster management is equally important. If the public is educated, facing disasters will be much easier. The disaster will affect the users if it strikes at the working hours of the museum. They can also help save the precious collections, hence, the necessity of educating the public.

An Entrance Gallery in Museums

All the museums should have an entrance gallery specially dedicated to offering information about disaster management in that particular museum. This section can give information about do's and dont's in the museum. So, the public will know what should be done in case of fire or earthquake. For

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examples, they should be informed about the location of escape doors. Currently, all the museums do not offer proper instructions to the public. If a separate gallery is created, in addition to displaying messages at relevant areas, it will be easier to educate people about disaster management in the museums. A first aid box can also be provided in this section.

Disaster Management Gallery in Museums

In the recent past, India has been facing a number of disasters. However, the public does not know how to face (or prepare for) these disasters. Therefore, it is necessary to educate people how they have to act in case of disasters. This can help save the life of people as well as properties. Currently, there is no effective means to communicate to people about disasters. Museums can be used as an effective medium in this regard.

Museums can take up the role of educating people about various disasters. For example, museums can tell people about earthquake and its side effects, and how to be prepared for it, how an earth-quake proof building can be built and other relevant information. All the museums should have a separate gallery on general disaster management. This will definitely be a great service to the nation.

Involving the Public in Disaster Management

Apart from the users, the people who live in the vicinity of the museum should also be educated about disasters. Because, disaster striking the museum could affect the people who live in the neighbourhood, and similarly, disasters in the neighbourhood could affect the museums. The local people can be of great help in preventing or tackling disasters in museums.

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Meetings or festival can be arranged to educate the public about the importance of the museum and the activities to be taken during disasters. This can help detect disasters early. For instance, if a disaster strikes on holidays or nights, the local people could be the first to notice it. Hence, they should also be informed of important phone numbers and the actions to be taken.

National Centre for Disaster Education

A separate national centre has to be created to educate and train the personnel and the public in disaster management. This centre can get the resources and offer training across India.

Summary

- Train the staff and the public in disaster management.
- Give theoretical and practical training (e.g. use of fire fighting equipment) to the staff.
- Give a guidebook with basic information (important phone nos. and action to be taken) for all the staff and the public in the vicinity of the museums.
- Involve the users and local people in disaster management.
- Keep a First Aid Kit in all the museums.
- Open a separate gallery for Disaster Management in all museums for public awareness.
- Conduct periodic mock drills to keep the staff alert.
- Create a National Centre for Disaster Education.

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DISASTER MANAGEMENT AND PREPAREDNESS FOR CONSERVATION LABORATORIES

Dr. V.R. Shaji

Conservation laboratories need not be dangerous places in which to work, despite many potential hazards associated with them , provided that certain elementary precautions are taken and that each worker conducts himself with commonsense and alertness. Every worker must adopt a responsible attitude to his work and avoid any thoughtlessness, ignorant or hurried behaviour which may lead to an accident and possible harm to him or to others. Laboratory accidents are very often caused by attempts to obtain results in too great a hurry. The laboratory chemist must therefore always adopt a thoughtful, careful, methodical approach to what he is doing.

Coupled with a general consideration for the safety of others, tidiness is a major factor in laboratory safety. The laboratory must be kept clean and tidy at all times. Any spillage on a floor or bench should be thoroughly cleaned up immediately.

It is essential that those working in laboratories should become familiar with all the procedures and also acquire dexterity in handling the various processes of apparatus. The habit of clean and orderly working must also be cultivated and observance of the following points will be helpful in this direction.

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1. The bench must be clean and the bench cloth must be available so that any spillages of solid or liquid chemicals can be removed immediately.
2. Under no circumstances should the working surface of the bench become cluttered.
3. All the apparatus associated with some particular operation should be grouped together on the bench to avoid confusion.
4. The solutions, reagents, the reagent bottles must be labelled so that the contents can be readily identified.
5. Reagent bottles must never be allowed to accumulate on the bench. They must be placed on the reagent shelves immediately after use.

Every person working in a laboratory should ensure that he knows where the exits and fire escapes are situated and that there is free access to them. The worker should also note the positions of fire extinguishers, fire blankets and drench showers and make sure that he knows how to use them .He should also know the location of the first aid equipment provided for emergency use, the position of the nearest telephone and the numbers of the appropriate medical teams, hospitals and fire brigades.

Clear instructions must be left so that an unqualified person can terminate the experiment in an emergency. 'Please leave on' notices should be left along side any service which is to be left running (water, electricity etc.)

Particular care should be taken when handling inflamm able solvents which are highly volatile. The vapour may drift to a distant ignition source and burn back to ignite the main bulk of liquid .An important rule is never to allow any vapour

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of a volatile chemical to escape into the open laboratory.

It is strongly recommended that all reactions involving any possible hazard from explosive inflammable or highly toxic substances should be carried out in a special laboratory solely designed for the purpose. Such laboratory should not be used for any routine work. Ideally the laboratory should be purpose built and should incorporate the following safety features:-

a) Water proof and vapour proof electric lamps, switches and power points.

b) Fire resistant doors and walls.

c) Good quality safety shields.

d) An automatic carbon dioxide fire extinguishing system.

e) Laboratory must be sited at a safe distance from a regularly occupied offices and may be constructed with light weight and fire proof building materials

The modern conservation laboratory contains a wide variety of toxic and flammable chemicals. Emergencies in conservation laboratories include accidental release of toxic gases such as ethylene oxide, chemical spills of solvents fires and explosions, and personal injuries resulting from physical accidents .If an emergency emanates from a conservation laboratory the conservator must be able to shut down any process.

The emergency action plan must include the following:-

1. Emergency escape procedures and emergency escape route.
2. Procedures to be followed by employees to shut down laboratories.

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3. Rescue and medical duties for those employees who are to perform them.
4. Written priorities for artifacts.
5. Procedures to account for all employees.

There are four steps involved in the preparation and implementation of an emergency plan.

1. Planning.
2. Documentation.
3. Training.
4. Periodic drills

Planning: - The effectiveness of the emergency plan depends on the mode of planning. The planning includes identifying the potential emergencies that could develop and the procedures to be followed in case of an emergency. An emergency coordinator must be appointed to coordinate the work of emergency teams

Training :- Depending on the size of laboratory more than one team may be trained for various types of emergencies. Areas in which teams have to be trained include; 1.Use of various types of fire extinguishers.2.Shut down procedures.3.Evacution procedures.4 .First aid. 5. Chemical spill control procedures.6.Removal of collections.6.They must be trained to recognize an emergency which is beyond their capacity to handle.7.All employees must be given mental training to face all types of disasters.8.Emergency communication systems

Documentation:- A systematically organized and written plan enables to respond quickly and efficiently to an emergency .It minimizes damage to collections and building

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.The importance of having the plan in written form cannot be overlooked. In the confusion of an emergency, procedures are easily forgotten. Information recorded in writing is much likely to be overlooked .Copies of plan should be distributed among the emergency team.

Drills:- The best way to deal with disaster is to be prepared for it. Regular drills must be conducted whenever possible. All types of drills such as fire drills, medical drills etc can be carried out. Providing the best protection for the collections from disasters is a basic principle of preventive maintenance. The guidelines mentioned above will help to ascertain the extent to which the protection of valuable collections is possible.

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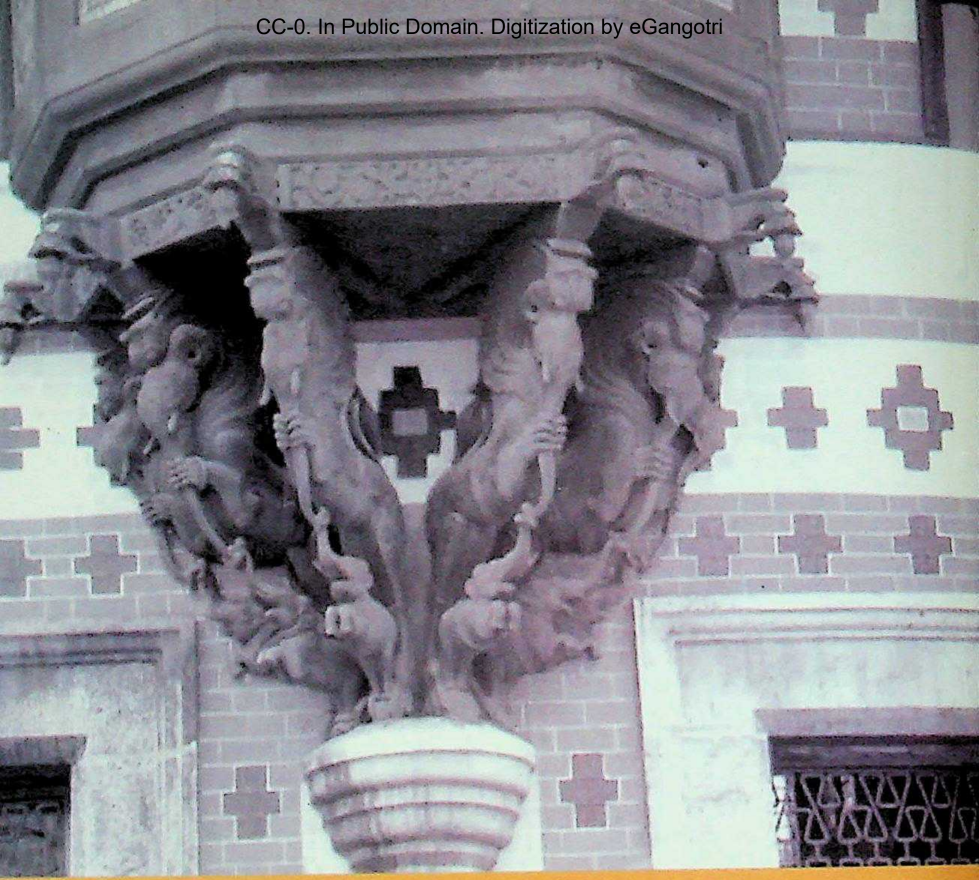

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